Volume 3, Issue 10, October 2025 ISSN (E): 2938-3765

# FEATURES OF THE 24-HOUR BLOOD PRESSURE PROFILE IN PATIENTS WITH ARTERIAL HYPERTENSION AND VARIOUS CARDIAC RHYTHM DISORDERS

Nuritdinova N. Batirovna
Shaolimova Z. Mirabitovna
Tashkent State Medical University, Tashkent, Uzbekistan

**Abstract**
The aim of the study is to analyze the characteristics of the 24-hour blood pressure (BP) profile in patients with arterial hypertension (AH) complicated by various cardiac rhythm disorders. The interrelationships between the type of arrhythmia and the parameters of 24-hour blood pressure monitoring (ABPM) are examined.

**Keywords**: Arterial hypertension, cardiac rhythm disorders, 24-hour blood pressure profile, variability, ABPM.

## Introduction

Arterial hypertension (AH) is the most common cardiovascular disease worldwide, affecting 15–25% of the adult population, and continues to remains an important medical and social issue. AH is regarded not only as a cardiovascular condition but also as an overall modifiable risk factor (RF) for the development of non-communicable diseases (NCD). Therefore, hypertension can be viewed as an integrative indicator for assessing the effectiveness of NCD prevention strategies [1].

At present, the main method for diagnosing elevated blood pressure and assessing treatment efficacy remains one or several blood pressure (BP) measurements throughout the day. However, such measurements do not provide complete information about the 24-hour BP profile. Diagnostic value lies not only in traditional single measurements but also in BP values during sleep, physical and mental activity, and at various times after medication intake, etc. [2]. This information is provided by the method of ambulatory 24-hour blood pressure monitoring (ABPM).

The ABPM method is increasingly used in both clinical practice and research because it has been shown that certain indicators of the 24-hour BP profile correlate more strongly with target organ damage and the level of cardiovascular risk than conventional single BP measurements [3,4]. ABPM allows for the calculation of average daily BP and pulse values, average daytime and nighttime BP levels, the degree of nocturnal BP reduction and morning surge, BP response to physical and emotional stress, the intensity and duration of hypertensive load on target organs, as well as BP and pulse variability throughout the day, and the detection of hypotensive episodes. The main indicators for ABPM analysis include mean BP values, pressure load indices, circadian rhythm parameters, BP variability, and indices of morning BP surge. Arterial hypertension and cardiac rhythm disorders are two of the most common cardiovascular pathologies that often coexist and aggravate each



Web of Medicine: Journal of Medicine, Practice and Nursing
webofjournals.com/index.php/5

other's course. Disruption of the circadian BP rhythm contributes to myocardial electrical instability, while arrhythmias, in turn, enhance autonomic dysregulation and lead to additional variability in hemodynamic parameters. Ambulatory blood pressure monitoring provides an opportunity not only to assess the degree of hypertension but also to identify hidden rhythm disturbances—such as the "non-dipper," "over-dipper," and "night-peaker" patterns—which play a significant role in forming the arrhythmogenic substrate. However, the specific importance of individual BP monitoring parameters in the development of target organ damage remains incompletely understood. Many authors have reported rhythm disturbances in patients with arterial hypertension [5]. Researchers studying the problem of automatism and conduction disorders in hypertensive patients generally agree that supraventricular extrasystoles (SVE) and ventricular extrasystoles (VE) are quite common, while supraventricular tachycardia (SVT), atrial fibrillation (AF, particularly its paroxysmal form), and atrioventricular or intraventricular blocks are observed less frequently [6].

In 62% of examined patients with AH, ventricular rhythm disturbances were detected, with high-grade arrhythmias according to the Lown classification found in 50% of cases. After physical exertion, particularly during exercise testing (VEM), the frequency of ventricular rhythm disturbances increased to 73% [7].

## Materials and Methods

The study included 82 patients aged 40–72 years with arterial hypertension (AH) of stages I–III who underwent examination and treatment in the cardiology department. All patients underwent 24-hour blood pressure monitoring (ABPM, BPLab device), electrocardiography (ECG) and 24-hour Holter ECG monitoring, echocardiography, and biochemical testing.

Patients were divided into three groups: Group I – AH without rhythm disturbances (n=27), Group II – AH with supraventricular arrhythmias (extrasystole or paroxysmal tachycardia, n=32), and Group III – AH with ventricular arrhythmias or atrial fibrillation (n=23). ABPM parameters included mean systolic and diastolic BP, BP variability, hypertension time index, dipping coefficient, and morning surge amplitude. Data were analyzed using SPSS v.26.0. Correlations were assessed with Pearson's coefficient, and statistical significance was accepted at $p<0.05$.

## Results

In patients with arterial hypertension and cardiac rhythm disorders, distinct alterations in the circadian BP profile were identified: In Group II (supraventricular arrhythmias), mean systolic BP variability reached 17.8 ± 2.6 mmHg, and non-dipper profiles were observed in 49.6% of cases. In Group III (AF and ventricular arrhythmias), a night-peaker pattern prevailed—nocturnal SBP exceeded daytime SBP by 5–7 mmHg, accompanied by sympathetic overactivity and baroreflex impairment. Ventricular arrhythmias were associated with a high hypertension time index (68–73%) and a more marked morning BP surge (ΔSBP = 25 ± 7 mm Hg), which increases the risk of early-morning arrhythmic events and sudden cardiac death.

The hypertension time index in this group averaged 71%, while the morning surge (ΔSBP) reached 25 ± 7 mmHg, significantly higher than in other groups ($p<0.01$). A negative correlation was identified between the dipping index and extrasystole frequency ($r = –0.45$; $p < 0.01$), and a positive



Web of Medicine: Journal of Medicine, Practice and Nursing
webofjournals.com/index.php/5

correlation between SBP variability and left ventricular mass index ($r = 0.47$; $p < 0.05$). These findings indicate that disrupted BP regulation contributes to structural myocardial remodeling and arrhythmic susceptibility.

## Discussion

The obtained results indicate that patients with arterial hypertension (AH) and arrhythmias exhibit disturbances in the normal circadian rhythm of blood pressure. The predominance of non-dipper and night-peaker profiles reflects increased sympathetic activity, impaired parasympathetic regulation, and reduced vascular reactivity.

Of particular importance is the relationship between the type of 24-hour BP profile and the risk of arrhythmic events: supraventricular extrasystoles are more frequently recorded in non-dipper patients, atrial fibrillation episodes are typical of the night-peaker type, and a pronounced morning surge correlates with ventricular arrhythmias.

Thus, 24-hour blood pressure monitoring (ABPM) is an essential tool not only for evaluating the effectiveness of antihypertensive therapy but also for predicting arrhythmogenic risk in hypertensive patients.

## Conclusion

In patients with arterial hypertension complicated by cardiac rhythm disturbances, the 24-hour BP profile is characterized by increased variability and a reduction in nocturnal BP decline. The night-peaker pattern, marked by elevated nighttime pressure and frequent atrial fibrillation episodes, is considered the most unfavorable. Assessment of the 24-hour BP profile should be regarded as a mandatory component in the examination of patients with hypertension and arrhythmias, as it enables individualized therapy and helps reduce the risk of complications.

The combined use of ABPM and Holter monitoring represents a promising approach for the prevention of sudden cardiac death.

## References

1. O'Brien E., Parati G., Stergiou G. European Society of Hypertension position paper on ambulatory blood pressure monitoring. J Hypertens. 2023;41(2):223–245.
2. Whelton P.K., Carey R.M., Mancia G. et al. 2023 ESH/ESC Guidelines for the management of arterial hypertension. Eur Heart J. 2023;44(31):2811–2902.
3. Kario K., et al. Morning blood pressure surge and cardiovascular events in hypertensive patients with arrhythmias. Hypertension. 2022;80(5):987–996.
4. Hermida R.C., Smolensky M.H., Ayala D.E. Circadian rhythm of blood pressure: implications for cardiovascular risk. Chronobiol Int. 2021;38(8):1156–1165.
5. Shalnova S.A., Boycov S.A. Circadian Blood Pressure Profile in Hypertensive Patients with Atrial Fibrillation. Cardiology. 2021;61(3):25–31.
6. Hermida R.C., et al. Circadian rhythm of blood pressure in hypertensive patients: implications for cardiovascular risk. Chronobiol Int. 2020;37(8):1121–1134.
7. Cohen J.B., Lotito M.J., Trudel X. et al. Blood pressure variability and risk of cardiovascular outcomes. JAMA Cardiol. 2022;7(6):639–648.



Web of Medicine: Journal of Medicine, Practice and Nursing
webofjournals.com/index.php/5